WHAT IS CLAIMED IS:

1. A method of transferring a non-time-critical, error-intolerant data segment stored on a disk drive, which is responsive to a set of data transfer commands generated by a host processor and which is operating in a mode optimized for transferring time-critical, error-tolerant streaming data segments stored or to be stored on the disk drive, the method comprising:

sending a sequence of data transfer commands generated by the host processor to the disk drive to transfer a respective sequence of time-critical, error-tolerant streaming data segments at a required data transfer rate;

selectively interposing a first data transfer command into the sequence of data transfer commands, the first data transfer command initiating a first transfer of the non-time-critical, error-intolerant data segment from a first storage location;

transmitting a data transfer error signal generated by the disk drive to the host processor, the data transfer error signal having a state that indicates whether any data transfer errors have occurred with respect to the first transfer of the non-time-critical, error-intolerant data segment; and

selectively interposing a second data transfer command into the sequence of data transfer commands, the second data transfer command initiating a second transfer of the non-time-critical, error-intolerant data segment from a second storage location, thereby utilizing storage redundancy to achieve an accuracy required for the non-time-critical, error-intolerant data segment while maintaining the required data transfer rate of the sequence of time-critical, error-tolerant streaming data segments.

2. The method of Claim 1, wherein the second storage location has a predetermined relation to the first storage location.
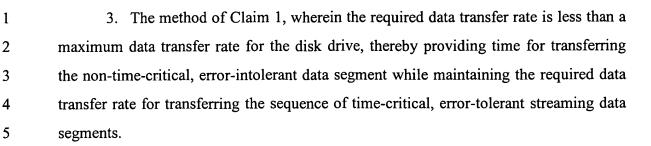
1   3. The method of Claim 1, wherein the required data transfer rate is less than a

2   maximum data transfer rate for the disk drive, thereby providing time for transferring

3   the non-time-critical, error-intolerant data segment while maintaining the required data

4   transfer rate for transferring the sequence of time-critical, error-tolerant streaming data

5   segments.

1   4. The method of Claim 1, wherein the time-critical, error-tolerant streaming

2   data segments correspond to audio/visual data.

1   5. The method of Claim 1, wherein the set of data transfer commands requires

2   no disk-drive-resident error recovery in the event of a data transfer error.

1   6. The method of Claim 1, wherein the disk drive is compatible with one or

2   more standards from the group: ATA, SCSI, IEEE 1394.

1   7. A method of storing a non-time-critical, error-intolerant data segment on a

2   disk drive, which is responsive to a set of data transfer commands generated by a host

3   processor and which stores both time-critical, error-tolerant data segments and non-

4   time-critical, error-intolerant data segments, the method comprising:

5   sending a first data transfer command generated by the host processor to

6   the disk drive to write the non-time-critical, error-intolerant data segment on the

7   disk drive;

8   writing the non-time-critical, error-intolerant data segment at a first

9   storage location; and

10   writing the non-time-critical, error-intolerant data segment at a second

11   storage location different from the first storage location.

1   8. The method of Claim 7, wherein the second storage location is at a

2   predetermined position relative to the first storage location.

1   9. The method of Claim 7, wherein the method further comprises:

2   sending a sequence of data transfer commands generated by the host

3   processor to the disk drive to transfer a respective sequence of time-critical,

4   error-tolerant streaming data segments at a required data transfer rate;

5   transmitting a first data transfer error signal generated by the disk drive

6   to the host processor, the data transfer error signal having a state that indicates

7   whether any data transfer errors have occurred with respect to the writing of the

8   non-time-critical, error-intolerant data segment to the first storage location;

9   transmitting a second data transfer error signal generated by the disk

10   drive to the host processor, the data transfer error signal having a state that

11   indicates whether any data transfer errors have occurred with respect to the

12   writing of the non-time-critical, error-intolerant data segment to the second

13   storage location;

14   selectively interposing a second data transfer command into the sequence

15   of data transfer commands to write the non-time-critical, error-intolerant data

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16   segment on the disk drive if a data transfer error has occurred with respect to the

17   writing of the non-time-critical, error-intolerant data segment to the first storage

18   location or the second storage location; and

19   writing the non-time-critical, error-intolerant data segment to the disk

20   drive at a third storage location.

1   10. The method of Claim 9, wherein the third storage location is the first storage

2   location if the data transfer error has occurred with respect to the writing to the first

3   storage location, and the third storage location is the second storage location if the data

4   transfer error has occurred with respect to the writing to the second storage location.

1   11. The method of Claim 9, wherein the third storage location is different from

2   both the first storage location and the second storage location.

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1   12. A method of transferring a non-time-critical, error-intolerant data segment

2   stored on a disk drive, which is responsive to a set of data transfer commands generated

3   by a host processor and which is operating in a mode optimized for transferring time-

4   critical, error-tolerant streaming data segments stored or to be stored on the disk drive,

5   the method comprising:

6   sending a sequence of data transfer commands generated by the host

7   processor to the disk drive to transfer a respective sequence of time-critical,

8   error-tolerant streaming data segments within a data transfer bandwidth less than

9   a maximum bandwidth for the disk drive;

10   selectively interposing a first data transfer command into the sequence of

11   data transfer commands, the first data transfer command initiating a first transfer

12   of the non-time-critical, error-intolerant data segment from a first storage

13   location, the first transfer of the non-time-critical, error-intolerant data segment

14   occurring within a remaining bandwidth that is a difference between the

15   maximum bandwidth and the data transfer bandwidth;

16   transmitting a data transfer error signal generated by the disk drive to the

17   host processor, the data transfer error signal having a state that indicates whether

18   any data transfer errors have occurred with respect to the first transfer of the

19   non-time-critical, error-intolerant data segment; and

20   selectively interposing a second data transfer command into the sequence

21   of data transfer commands, the second data transfer command initiating a second

22   transfer of the non-time-critical, error-intolerant data segment from a second

23   storage location, thereby utilizing storage redundancy to achieve an accuracy

24   required for the non-time-critical, error-intolerant data segment while

25   maintaining the data transfer bandwidth for the sequence of time-critical, error-

26   tolerant streaming data segments.

1   13. The method of Claim 12, wherein the second storage location has a

2   predetermined relation to the first storage location.

1   14. A video recording system to record and playback non-time-critical, error-

2   intolerant data segments and time-critical, error-tolerant streaming data segments using

3   a disk drive responsive to a set of data transfer commands and optimized for transferring

4   time-critical, error-tolerant streaming data segments at a required data transfer rate, the

5   video recording system comprising:

6   a user interface that receives user input;

7   a video input interface that receives an external video data stream for a

8   selected video program segment and that generates time-critical, error-tolerant

9   streaming data segments;

10   a video output interface that is connectable to a display device; and

11   a data management system that comprises:

12   at least one data buffer that receives, stores, and transmits time-

13   critical, error-tolerant streaming data segments; and

14   a host processor that generates a sequence of data transfer

15   commands sent to the disk drive to transfer a respective sequence of

16   time-critical, error-tolerant streaming data segments at the required data

17   transfer rate; that selectively interposes a first data transfer command into

18   the sequence of data transfer commands, the first data transfer command

19   initiating a first transfer of a non-time-critical, error-intolerant data

20   segment from a first storage location; that receives a data transfer error

21   signal generated by the disk drive, the data transfer error signal having a

22   state that indicates whether any data transfer errors have occurred in the

23   first transfer of the non-time-critical, error-intolerant data segment; and

24   that selectively interposes a second data transfer command into the

25   sequence of data transfer commands, the second data transfer command

26   initiating a second transfer of the non-time-critical, error-intolerant data

27   segment from a second storage location, thereby utilizing storage

28   redundancy to achieve an accuracy required for the non-time-critical,

29   error-intolerant data segment while maintaining the required data transfer

30   rate of the sequence of time-critical, error-tolerant streaming data

31   segments.

1   15. The video recording system of Claim 14, wherein the data management

2 system further comprises at least one data buffer that receives, stores, and transmits non-

3 time-critical, error-intolerant data segments.

1   16. The video recording system of Claim 14, wherein the data management

2 system further comprises a command buffer.

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